

Applying Leaf Management for Phosphorus Reduction Credit in a TMDL Area

2018 Waukesha County
Storm Water Workshop





Topics Included

- Interim Leaf Management Credit Examples
- TMDL Implementation Plan Example for an MS4

Leaf Collection Programs

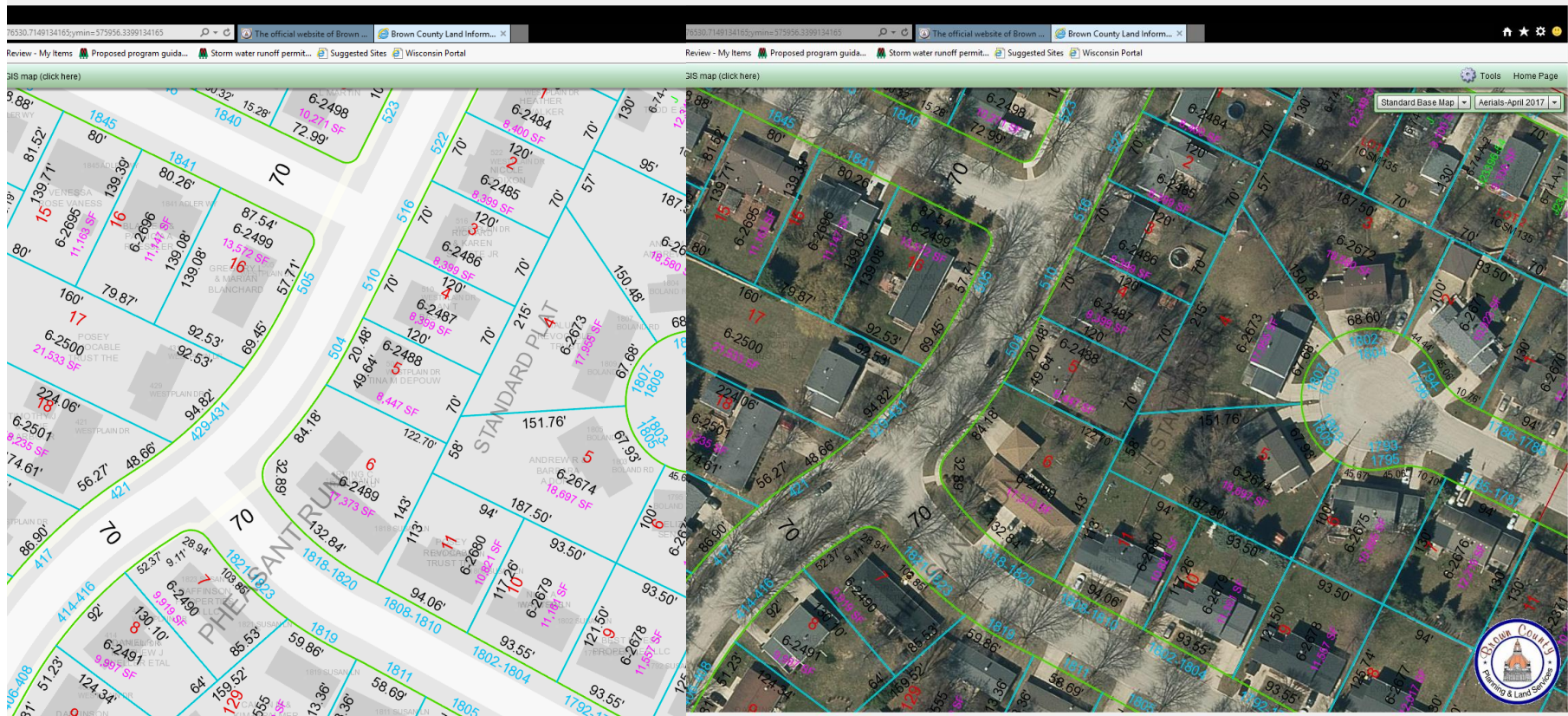
Key Elements:

- Setting:
 - Medium Density Residential Land use
 - Curb & Gutter Drainage with Light Parking Density
 - Tree Cover- 17%



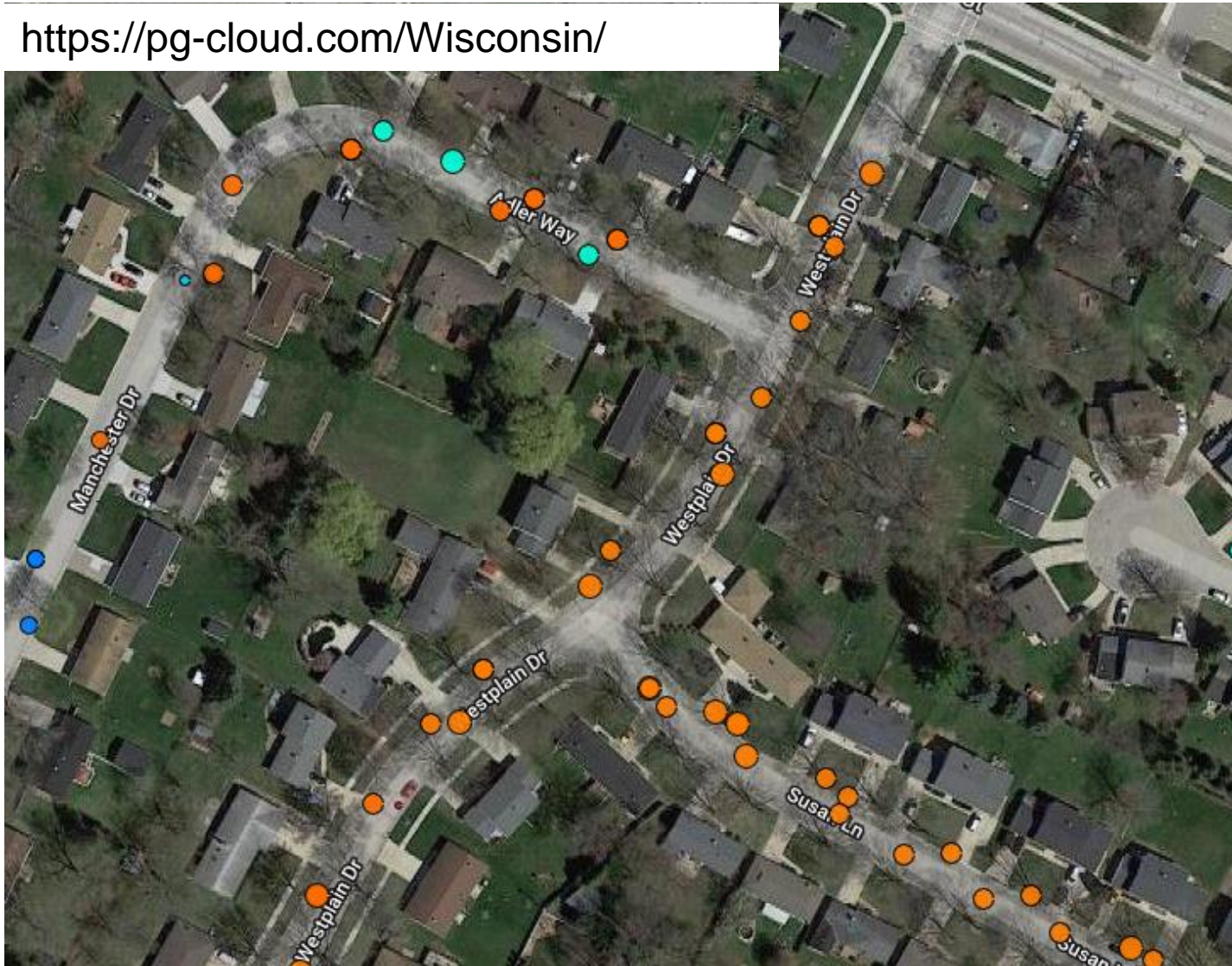
Medium Density Residential

2-6 units per acre = 0.17-0.5 ac lots



Tree Density

<https://pg-cloud.com/Wisconsin/>



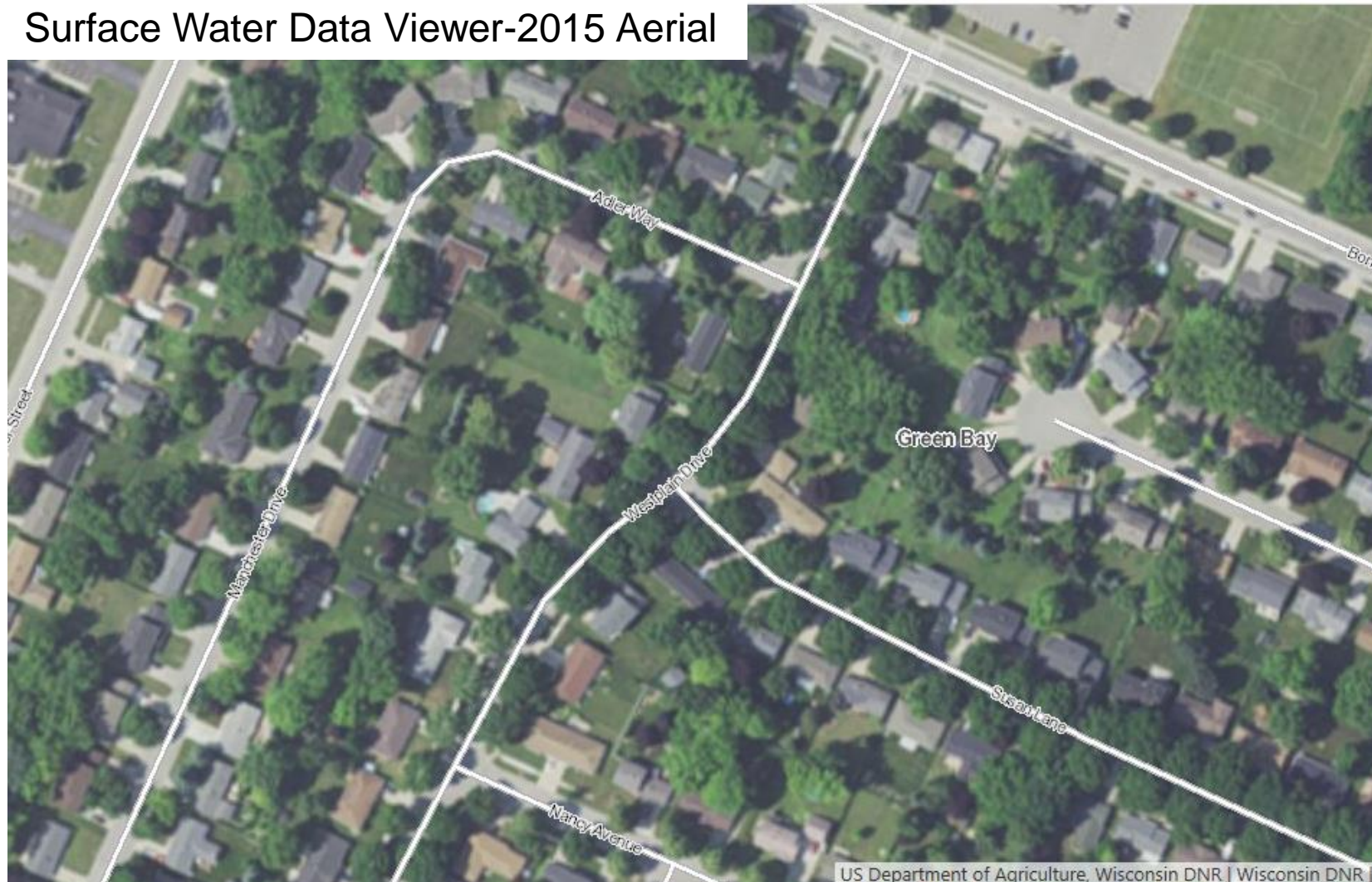
Tree Density-Aerial Photos

Navigation

Identify

Print

Surface Water Data Viewer-2015 Aerial



Leaf Collection Programs

Key Elements:

- Leaf Management
 - No leaves raked into streets
 - Collection Frequency
 - Cleaning Frequency/Timing



Collection

Compliant Program:
3-4 times/season



- Reduces Potential for Inlet Clogging
- Increases Street Cleaning Efficiency



Why Clean after Collection?





Leaf Collection Examples

Harsookville has the current program:

- Requires raking of leaves into the street
- Dense on-street parking
- Collects 2 Times/Fall
- Sweeps streets bi-weekly during fall

What would need to change?



Hartsookville DA 1

- 80 acres MDRNA
- 20 acres Strip Commercial
- BMP: Vacuum Sweeper 1 x/4 weeks
- BMP: Compliant Leaf Management Program

WinSLAMM Output:

Pollutant	Pollutant Yield No Controls (lbs/yr)	Pollutant Load With Controls (lbs/yr)	Percent Yield Reduction
Particulate Solids	27,439	23,976	12.6
Total Phosphorus	87.08	80.06	8.1 < 17%



Hartsookville DA 1

- 80 acres MDRNA @ 0.82 lbs TP/ac/yr
No Controls
- 20 acres Strip Commercial-Balance
of No Controls TP/ac/yr

Land Use	TP Yield No Controls (lbs/yr)	TP Load With Controls (lbs/yr)	TP Percent Yield Reduction
MDRNA	65.60		
Strip Commercial	21.48		

Hartsookville DA 1

Land Uses		
Runoff Volume		
Yield		
Data File: C:\Program Files (x86)\WinSLAMM		
Rain File: WisReg - Green Bay WI Five 1968-		
Date: 01-29-18 Time: 4:42:34 PM		
Site Description:		
Residential: Medium Density Res. No Alleys A		
Summary for Runoff Producing Events		
	Rain Total (in.)	Land Use Totals
Minimum:	0.00	0
Maximum:	2.94	14.52
Fl\Wt Ave:	N/A	3.573
Total:	113.02	302.9
Commercial: Strip Commercial Areas - Pollutar		
Summary for Runoff Producing Events		
	Rain Total (in.)	Land Use Totals
Minimum:	0.00	0
Maximum:	2.94	2.588
Fl\Wt Ave:	N/A	0.8033
Total:	113.02	97.37

60.58

19.47

- Output/Land Uses/Pollutants/Yield
- Divide by 5 years
- Use With Controls Strip Commercial for Street Cleaning



Applying the Credit

Pollutant	Pollutant Yield No Controls (lbs/yr)	Pollutant Load With Controls (lbs/yr)	Percent Yield Reduction
Particulate Solids-DA1	27,439	23,976	12.6
Total Phosphorus from MDRNA	65.60	54.45	17% From Leaf Management
Total Phosphorus from Strip Commercial	21.48	19.47	9.4% from Street Cleaning
Total Phosphorus DA1	87.08	73.92	15.1%



Hartsookville DA 2

- 80 acres MDRNA
- 20 acres Strip Commercial
- BMP: Regional Pond and Compliant Leaf Management Program

WinSLAMM Output:

Pollutant	Pollutant Yield No Controls (lbs/yr)	Pollutant Load With Controls (lbs/yr)	Percent Yield Reduction
Particulate Solids	27,439	15,685	42.8
Total Phosphorus	87.08	60.34	30.7 > 17%

Use Pond TP Reduction for DA2



Hartsookville DA 3

- 100 acres MDRNA
- BMP: Compliant Leaf Management Program

WinSLAMM Output:

Pollutant	Pollutant Yield No Controls (lbs/yr)	Pollutant Load With Controls (lbs/yr)	Percent Yield Reduction
Particulate Solids	21,568	21,568	0.0
Total Phosphorus	82.00	82.00	0.0 > 17%

Apply Leaf Management to entire DA



Applying the Credit

Basin	TSS Yield No Controls (lbs/yr)	TSS Load With Controls (lbs/yr)	TSS Percent Yield Reduction	TP Yield No Controls (lbs/yr)	TP Load With Controls (lbs/yr)	TP Percent Yield Reduction
DA1	27,439	23,976	12.6	87.08	73.92	15.1
DA2	27,439	15,685	42.8	87.08	60.34	30.7
DA3	21,568	21,568	0.0	82.00	68.06	17.0
Total	76,446	61,229	19.9	256.16	202.32	21.0



Without the Credit

Basin	TSS Yield No Controls (lbs/yr)	TSS Load With Controls (lbs/yr)	TSS Percent Yield Reduction	TP Yield No Controls (lbs/yr)	TP Load With Controls (lbs/yr)	TP Percent Yield Reduction
DA1	27,439	23,976	12.6	87.08	80.06	8.1
DA2	27,439	15,685	42.8	87.08	60.34	30.7
DA3	21,568	21,568	0.0	82.00	82.00	0.0
Total	76,446	61,229	19.9	256.16	222.4	13.2



TMDL Upcoming Submissions

MS4 Permittees covered under WPDES Permit No. WI-S050075-2 and located in an Approved TMDL Basin, the items listed in Sections 1.5.4.4 and 1.5.4.5

(<http://dnr.wi.gov/topic/StormWater/documents/WPDES-WI-S050075-2.pdf>) are due on March 31, 2018.

- Modeling-Where do you stand relative to removals?
- Planning-How and when will action be taken?



TMDL Upcoming Submissions

- A suggested format is available in Appendix B of <http://dnr.wi.gov/topic/stormwater/documents/M4TMDLImpGuidance.pdf>
- Submit using the Department's e-permitting system:
<http://dnr.wi.gov/topic/stormwater/municipal/eReporting.html>



Hartsookville Summary

Bench- mark (BM)	BM Description	Drainage Areas from model	BM Start Date	Measure Treatment Performance	BM % reduction toward TMDL Reduction
N/A	Maintain Existing	All	Ongoing	19.9% TSS 13.2% TP	TSS: 19.9% TP: 13.2%
1	Add Leaf Collection	DA1, DA3	Fall 2018	19.9% TSS 21.0% TP	TSS: 0.0% TP: 7.8%
2	Increase Street Cleaning Frequency & enact parking ordinance	DA1	Fall 2019	23.6% TSS 21.5% TP	TSS: 3.7% TP: 0.5%
3	Construct Pond	DA3	Fall 2020	46.2% TSS 35.8% TP	TSS: 22.6% TP: 13.8%

USGS – Next Monitoring Projects

- Madison monitoring (2013 – 2017) lead to interim guidelines.
- With funding, USGS plans to expand monitoring
- Monitoring proposed to take place in Fond du Lac between 2018 - 2020.
- Possible 2nd City depending on actual funds.
- Purpose of the additional monitoring: document more leaf management conditions and expand current guidance.
- Study is funded through a cooperative effort of the USGS, WI League of Municipalities, and 34 MS4s who agreed to help fund the program.
- Updates to the current guidance likely not till after 2020.

Questions?

